| CERTIFICATE OF HAND DELIVERY | | | |
|---|---|---|---|
| I hereby certify that this correspondence is being deposited with the United States Patent and Trademark Office by Hand Delivery to the following address: Assistant Commissioner for Patents, Washington, D.C. 20231. | | | |
| **Typed or Printed Name** | SARAH C Cannon | | |
| **Signature** | Sarah C Cannon | **Date** | 3/25/02 |

| | | |
|---|---|---|
| **DECLARATION OF FILIPPO M. RANDAZZO AND GEORGE LAMSON UNDER 37 C.F.R. § 1.132** | Attorney Docket | 23001487 |
| | First Named Inventor | Williams et al. |
| | Application Number | 09/313,292 |
| | Filing Date | May 13, 1999 |
| | Group Art Unit | 1631 |
| | Examiner Name | J. Brusca |
| Address to:<br>Assistant Commissioner for Patents | Title: *Novel Human Genes and Gene Expression Products* | |

Dear Sir:

1. I, Filippo M. Randazzo, declare and say I am a resident of the State of California. ~~My~~ residence address is 104 Capricorn Avenue, Oakland, CA 94611.

2. I hold a B.S. degree in Molecular Microbiology and Anthropology, which I received from the University of Notre Dame in 1985. I further hold a Ph.D. degree, which I received from Indiana University in 1991. I am skilled in the fields of genetics, molecular biology, developmental biology genomics and cancer biology. I am a co-inventor of the invention claims of the above-referenced patent application.

3. I, George Lamson, declare and say I am a resident of the State of California. My residence address is 232 Sandringham Dr., Moraga, CA.

4. I hold a BS degree in Biochemistry, which I received from the University of CA, Santa Barbara in 1976. I further hold a Ph.D. degree, which I received from University of CA, Berkeley, in 1982. I am skilled in the field of Bioinformatics. I am a co-inventor of the invention claims of the above-referenced patent application.

5. I have reviewed the relevant portions of the Office Action (specifically section no. 4), mailed August 31, 2001, in the above-referenced application. I understand that claims of the above-referenced patent application are rejected under 35 U.S.C. § 101 on the grounds that the claimed invention lacks patentable utility, and also under 35 U.S.C. § 112, ¶ 1, on the grounds that since the claimed invention is not supported by a patentable utility, one skilled in the art would not know how to use the claimed invention.

6. This Declaration provides further evidence of the patentable utility of the claimed invention. Specifically, this Declaration provides evidence that the nucleotide sequence designated SEQ ID NO: 1290 represents genes that are differentially expressed in cancer cells, thus supporting the assertion that the claimed invention has utility in detecting cancer cells.

7. The following experiments were conducted by me or under my direction.

8. Genes differentially expressed in cancerous cells were identified as detected by microarray hybridization analysis using materials obtained from patient colon tissue samples. The biological materials used in these experiments, the methods of analysis, and the results are described below.

9. **Source of patient tissue samples**. Normal and cancerous tissues were collected from patients using laser capture microdissection (LCM) techniques, which techniques are well known in the art. **Table 1** (Attachment 1) provides information about each patient from which the samples were isolated, including: the Patient ID ("PT ID") and Path ReportID ("Path ID"), which are numbers assigned to the patient and the pathology reports for identification purposes; the group ("Grp") to which the patients have been assigned; the anatomical location of the tumor ("Anatom Loc"); the primary tumor size ("Size"); the primary tumor grade ("Grade"); the identification of the histopathological grade ("Histo Grade"); a description of local sites to which the tumor had invaded ("Local Invasion"); the

presence of lymph node metastases ("Lymph Met"); the incidence of lymph node metastases (provided as a number of lymph nodes positive for metastasis over the number of lymph nodes examined) ("Lymph Met Incid"); the regional lymphnode grade ("Reg Lymph Grade"); the identification or detection of metastases to sites distant to the tumor and their location ("Dist Met & Loc"); the grade of distant metastasis ("Dist Met Grade"); and general comments about the patient or the tumor ("Comments"). Histopathology of all primary tumors indicated the tumor was adenocarcinoma except for Patient ID Nos. 130 (for which no information was provided), 392 (in which greater than 50% of the cells were mucinous carcinoma), and 784 (adenosquamous carcinoma). Extranodal extensions were described in three patients, Patient ID Nos. 784, 789, and 791. Lymphovascular invasion was described in Patient ID Nos. 128, 228, 278, 517, 534, 784, 786, 789, 791, 890, and 892. Crohn's-like infiltrates were described in seven patients, Patient ID Nos. 52, 264, 268, 392, 393, 784, and 791.

10. **Source of polynucleotides on arrays.** Polynucleotides spotted on the arrays were generated by PCR amplification of clones derived from cDNA libraries. The clones used for amplification were either the clones from which the sequences described herein were derived, or are clones having inserts with significant polynucleotide sequence overlap with the sequences described herein as determined by BLAST2 homology searching.

11. **Microarray Design**. Each array used in the examples below had an identical spatial layout and control spot set. Each microarray was divided into two areas, each area having an array with, on each half, twelve groupings of 32 x 12 spots for a total of about 9,216 spots on each array. The two areas are spotted identically which provide for at least two duplicates of each clone per array. Spotting was accomplished using PCR amplified products from 0.5kb to 2.0 kb and spotted using a Molecular Dynamics Gen III spotter according to the manufacturer's recommendations. The first row of each of the 24 regions on the array had about 32 control spots, including 4 negative control spots and 8 test polynucleotides. The test polynucleotides were spiked into each sample before the labeling reaction with a range of

concentrations from 2-600 pg/slide and ratios of 1:1. For each array design, two slides were hybridized with the test samples reverse-labeled in the labeling reaction. This provided for about 4 duplicate measurements for each clone, two of one color and two of the other, for each sample.

12. **Microarray Analysis**. cDNA probes were prepared from total RNA isolated from the patient cells described in **Table 1** (Attachment 1). Since LCM provides for the isolation of specific cell types to provide a substantially homogenous cell sample, this provided for a similarly pure RNA sample. Total RNA was first reverse transcribed into cDNA using a primer containing a T7 RNA polymerase promoter, followed by second strand DNA synthesis. cDNA was then transcribed *in vitro* to produce antisense RNA using the T7 promoter-mediated expression, and the antisense RNA was then converted into cDNA. The second set of cDNAs were again transcribed *in vitro*, using the T7 promoter, to provide antisense RNA. Optionally, the RNA was again converted into cDNA, allowing for up to a third round of T7-mediated amplification to produce more antisense RNA. Thus the procedure provided for two or three rounds of *in vitro* transcription to produce the final RNA used for fluorescent labeling. Fluorescent probes were generated by first adding control RNA to the antisense RNA mix, and producing fluorescently labeled cDNA from the RNA starting material. Fluorescently labeled cDNAs prepared from the tumor RNA sample were compared to fluorescently labeled cDNAs prepared from normal cell RNA sample. For example, the cDNA probes from the normal cells were labeled with Cy3 fluorescent dye (green) and the cDNA probes prepared from the tumor cells were labeled with Cy5 fluorescent dye (red).

13. The differential expression assay was performed by mixing equal amounts of probes from tumor cells and normal cells of the same patient. The arrays were prehybridized by incubation for about 2 hrs at 60°C in 5X SSC/0.2% SDS/1 mM EDTA, and then washed three times in water and twice in isopropanol. Following prehybridization of the array, the probe mixture was then hybridized to the array under conditions of high stringency (overnight

at 42°C in 50% formamide, 5X SSC, and 0.2% SDS. After hybridization, the array was washed at 55°C three times as follows: 1) first wash in 1X SSC/0.2% SDS; 2) second wash in 0.1X SSC/0.2% SDS; and 3) third wash in 0.1X SSC. The arrays were then scanned for green and red fluorescence using a Molecular Dynamics Generation III dual color laser-scanner/detector. The images were processed using BioDiscovery Autogene software, and the data from each scan set normalized to provide for a ratio of expression relative to normal. Data from the microarray experiments was analyzed according to the algorithms described in U.S. application serial no. 60/252,358, filed November 20, 2000, by E.J. Moler, M.A. Boyle, and F.M. Randazzo, and entitled "Precision and accuracy in cDNA microarray data." The experiment was repeated, this time labeling the two probes with the opposite color in order to perform the assay in both "color directions." Each experiment was sometimes repeated with two more slides (one in each color direction). The level fluorescence for each sequence on the array expressed as a ratio of the geometric mean of 8 replicate spots/genes from the four arrays or 4 replicate spots/gene from 2 arrays or some other permutation. The data were normalized using the spiked positive controls present in each duplicated area, and the precision of this normalization was included in the final determination of the significance of each differential. The fluorescent intensity of each spot was also compared to the negative controls in each duplicated area to determine which spots detected significant expression levels in each sample.

14. A statistical analysis of the fluorescent intensities was applied to each set of duplicate spots to assess the precision and significance of each differential measurement, resulting in a p-value testing the null hypothesis that there is no differential in the expression level between the tumor and normal samples of each patient. For initial analysis of the microarrays, the hypothesis was accepted if $p>10^{-3}$, and the differential ratio was set to 1.000 for those spots. All other spots have a significant difference in expression between the tumor and normal sample. If the tumor sample has detectable expression and the normal does not, the ratio is truncated at 1000 since the value for expression in the normal sample would be zero, and the ratio would not be a mathematically useful value (e.g., infinity). If the normal sample has

detectable expression and the tumor does not, the ratio is truncated to 0.001, since the value for expression in the tumor sample would be zero and the ratio would not be a mathematically useful value. These latter two situations are referred to herein as "on/off." Database tables were populated using a 95% confidence level ($p>0.05$).

15. In general, a polynucleotide is said to represent a significantly differentially expressed gene between two samples when there is detectable levels of expression in at least one sample and the ratio value is greater than at least about 1.2 fold, preferably greater than at least about 1.5 fold, more preferably greater than at least about 2 fold, where the ratio value is calculated using the method described above. A differential expression ratio of 1 indicates that the expression level of the gene in the tumor cell was not statistically different from expression of that gene in normal colon cells of the same patient. A differential expression ratio significantly greater than 1 in cancerous colon cells relative to normal colon cells indicates that the gene is increased in expression in cancerous cells relative to normal cells, indicating that the gene plays a role in the development of the cancerous phenotype, and may be involved in promoting metastasis of the cell.

16. **Table 2**, shown below, summarizes the results of the differential expression analysis in colon tissue. The table provides: the SEQ. ID. NO. of the polynucleotide corresponding to the polynucleotide on the spot on the array; the Sequence Name, the Clone Name, the number of patients tested (No. Tested), and the percentage of patients in which expression was detected in cancerous colon tissue at greater than or equal to a two-fold increase (>2x) relative to matched normal control colon tissue.

**TABLE 2**

| SEQ ID NO: | Sequence Name | Clone Name | No. Tested | >2x up 95% conf. | >5x up 95% conf. |
|---|---|---|---|---|---|
| 1290 | RTA00000630F.c.18.1 | M00022202C:F11 | 45 | 24.4 | 2.2 |

17. The data above support the assertion that a polynucleotide having a sequence of SEQ ID NO: 1290 represents genes that are differentially expressed in cancer cells, thus

supporting the assertion that the claimed invention has utility in detecting cancer cells. Specifically, detection of gene products that correspond to a genes having a sequence of SEQ ID NO: 1290 can provide an indicator that the cell is cancerous, and may provide a therapeutic and/or diagnostic target.

18. I, Filippo M. Randazzo, hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title XVIII of the United States Code, and that such will false statements may jeopardize the validity of the application or any patent issuing thereon.

3/13/02
Date

Filippo M. Randazzo

19. I, George Lamson, hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title XVIII of the United States Code, and that such will false statements may jeopardize the validity of the application or any patent issuing thereon.

3/13/02
Date

George Lamson
George Lamson

Attachments: Table 1 of patient data

F:\DOCUMENT\23001487\Declaration 1.132 - SEQ ID NO 1290.doc

**Table 1**

| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 16 | III | Cecum | 8.5 | T3 | G2 | through muscularis propria approaching pericolic fat, but not at serosal surface | Pos | 1/17 | N1 | Neg | M0 | Moderately differentiated |
| 15 | 21 | III | Ascending colon | 4.0 | T3 | G2 | Extending into subserosal adipose tissue | Pos | 3/8 | N1 | Neg | MX | invasive adenocarcinoma, moderately differentiated; focal perineural invasion is seen |
| 52 | 71 | II | Cecum | 9.0 | T3 | G3 | Invasion through muscularis propria, subserosal involvement; ileocec. valve involvement | Neg | 0/12 | N0 | Neg | M0 | Hyperplastic polyp in appendix. |
| 121 | 140 | II | Sigmoid | 6 | T4 | G2 | Invasion of muscularis propria into serosa, involving submucosa of urinary bladder | Neg | 0/34 | N0 | Neg | M0 | Perineural invasion; donut anastomosis Neg. One tubulovillous and one tubular adenoma with no high grade dysplasia. |

Table 1

| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125 | 144 | II | Cecum | 6 | T3 | G2 | Invasion through the muscularis propria into suserosal adipose tissue. Ileocecal junction. | Neg | 0/19 | N0 | Neg | M0 | patient history of metastatic melanoma |
| 128 | 147 | III | Transverse colon | 5.0 | T3 | G2 | Invasion of muscularis propria into percolonic fat | Pos | 1/5 | N1 | Neg | M0 | |
| 130 | 149 | | Splenic flexure | 5.5 | T3 | | through wall and into surrounding adipose tissue | Pos | 10/24 | N2 | Neg | M1 | |
| 133 | 152 | II | Rectum | 5.0 | T3 | G2 | Invasion through muscularis propria into non-peritonealized pericolic tissue; gross configuration is annular. | Neg | 0/9 | N0 | Neg | M0 | Small separate tubular adenoma (0.4 cm) |
| 141 | 160 | IV | Cecum | 5.5 | T3 | G2 | Invasion of muscularis propria into pericolonic adipose tissue, but not through serosa. Arising from tubular adenoma. | Pos | 7/21 | N2 | Pos - Liver | M1 | Perineural invasion identified adjacent to metastatic adenocarcinoma. |

**Table 1**

| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 156 | 175 | III | Hepatic flexure | 3.8 | T3 | G2 | Invasion through mucsularis propria into subserosa/pericolic adipose, no serosal involvement. Gross configuration annular. | Pos | 2/13 | N1 | Neg | M0 | Separate tubolovillous and tubular adenomas |
| 228 | 247 | III | Rectum | 5.8 | T3 | G2 to G3 | Invasion through muscularis propria to involve subserosal, perirectoal adipose, and serosa | Pos | 1/8 | N1 | Neg | MX | Hyperplastic polyps |
| 264 | 283 | II | Ascending colon | 5.5 | T3 | G2 | Invasion through muscularis propria into subserosal adipose tissue. | Neg | 0/10 | N0 | Neg | M0 | Tubulovillous adenoma with high grade dysplasia |
| 266 | 285 | III | Transverse colon | 9 | T3 | G2 | Invades through muscularis propria to involve pericolonic adipose, extends to serosa. | Neg | 0/15 | N1 | Pos - Mesenteric deposit | MX | |
| 267 | 286 | III | Ileocecal | 4.5 | T2 | G2 | Confined to muscularis propria | Pos | 2/12 | N1 | Neg | M0 | |

**Table 1**



| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 268 | 287 | I | Cecum | 6.5 | T2 | G2 | Invades full thickness of muscularis propria, but mesenteric adipose free of malignancy | Neg | 0/12 | N0 | Neg | M0 | |
| 278 | 297 | III | Rectum | 4 | T3 | G2 | Invasion into perirectal adipose tissue. | Pos | 7/10 | N2 | Neg | M0 | Descending colon polyps, no HGD or carcinoma identified.. |
| 295 | 314 | II | Ascending colon | 5.0 | T3 | G2 | Invasion through muscularis propria into percolic adipose tissue. | Neg | 0/12 | N0 | Neg | M0 | Melanosis coli and diverticular disease. |
| 296 | 315 | III | Cecum | 5.5 | T3 | G2 | Invasion through muscularis propria and invades pericolic adipose tissue. Ileocecal junction. | Pos | 2/12 | N1 | Neg | M0 | Tubulovillous adenoma (2.0 cm) with no high grade dysplasia. Neg. liver biopsy. |
| 300 | 319 | III | Descending colon | 5.2 | T2 | G2 | through the muscularis propria into pericolic fat | Pos | 2/2 | N1 | Neg | M0 | |
| 322 | 341 | II | Sigmoid | 7 | T3 | G2 | through the muscularis propria into pericolic fat | Neg | 0/5 | N0 | Neg | M0 | vascular invasion is identified |
| 339 | 358 | II | Rectosigmoid | 6 | T3 | G2 | Extends into perirectal fat but does not reach serosa | Neg | 0/6 | N0 | Neg | M0 | 1 hyperplastic polyp identified |

**Table 1**



| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 341 | 360 | II | Ascending colon | 2 cm invasive | T3 | G2 | Invasion through muscularis propria to involve pericolonic fat. Arising from villous adenoma. | Neg | 0/4 | N0 | Neg | MX | |
| 356 | 375 | II | Sigmoid | 6.5 | T3 | G2 | Through colon wall into subserosal adipose tissue. No serosal spread seen. | Neg | 0/4 | N0 | Neg | M0 | |
| 392 | 444 | IV | Ascending colon | 2 | T3 | G2 | Invasion through muscularis propria into subserosal adipose tissue, not serosa. | Pos | 1/6 | N1 | Pos - Liver | M1 | Tumor arising at prior ileocolic surgical anastomosis. |
| 393 | 445 | II | Cecum | 6.0 | T3 | G2 | Cecum, invades through muscularis propria to involve subserosal adipose tissue but not serosa. | Neg | 0/21 | N0 | Neg | M0 | |
| 413 | 465 | IV | Cecum | 4.8 | T3 | G2 | Invasive through muscularis to involve periserosal fat; abutting ileocecal junction. | Neg | 0/7 | N0 | Pos - Liver | M1 | rediagnosis of oophorectomy path to metastatic colon cancer. |

Table 1

| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 452 | 504 | II | Ascending colon | 4 | T3 | G2 | through muscularis propria approaching pericolic fat, but not at serosal surface | Neg | 0/39 | N0 | Neg | M0 | |
| 505 | 383 | IV | | 7.5 | T3 | G2 | Invasion through muscularis propria involving pericolic adipose, serosal surface uninvolved | Pos | 2/17 | N1 | Pos - Liver | M1 | Anatomical location of primary not notated in report. Evidence of chronic colitis. |
| 517 | 395 | IV | Sigmoid | 3 | T3 | G2 | penetrates muscularis propria, involves pericolonic fat. | Pos | 6/6 | N2 | Neg | M0 | No mention of distant met in report |
| 546 | 565 | IV | Ascending colon | 5.5 | T3 | G2 | Invasion through muscularis propria extensively through submucosal and extending to serosa. | Pos | 6/12 | N2 | Pos - Liver | M1 | |
| 577 | 596 | II | Cecum | 11.5 | T3 | G2 | Invasion through the bowel wall, into suberosal adipose. Serosal surface free of tumor. | Neg | 0/58 | N0 | Neg | M0 | Appendix dilated and fibrotic, but not involved by tumor |

**Table 1**



| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 695 | 714 | II | Cecum | 14.0 | T3 | G2 | extending through bowel wall into serosal fat | Neg | 0/22 | N0 | Neg | MX | moderately differentiated adenocarcinoma with mucinous diferentiation (% not stated), tubular adenoma and hyperplstic polyps present. |
| 784 | 803 | IV | Ascending colon | 3.5 | T3 | G3 | through muscularis propria into pericolic soft tissues | Pos | 5/17 | N2 | Pos - Liver | M1 | invasive poorly differentiated adenosquamous carcinoma |
| 786 | 805 | IV | Descending colon | 9.5 | T3 | G2 | through muscularis propria into pericolic fat, but not at serosal surface | Neg | 0/12 | N0 | Pos - Liver | M1 | moderately differentiated invasive adenocarcinoma |
| 787 | 806 | II | Rectosigmoid | 2.5 | T3 | G2-G3 | Invasion of muscularis propria into soft tissue | Neg | | N0 | Neg | MX | Peritumoral lymphocytic response; 5 LN examined in pericolic fat, no metastatases observed. |
| 789 | 808 | IV | Cecum | 5.0 | T3 | G2-G3 | Extending through muscularis propria into pericolonic fat | Pos | 5/10 | N2 | Pos - Liver | M1 | Three fungating lesions examined. |

**Table 1**



| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 790 | 809 | IV | Rectum | 6.8 | T3 | G1-G2 | Invading through muscularis propria into perirectal fat | Pos | 3/13 | N1 | Pos - Liver | M1 | |
| 791 | 810 | IV | Ascending colon | 5.8 | T3 | G3 | Through the muscularis propria into pericolic fat | Pos | 13/25 | N2 | Pos - Liver | M1 | poorly differentiated invasive colonic adenocarcinoma |
| 888 | 908 | IV | Ascending colon | 2.0 | T2 | G1 | Into muscularis propria | Pos | 3/21 | N0 | Pos - Liver | M1 | well to moderately differentiated adenocarcinomas; this patient has tumors of the ascending colon and the sigmoid colon |
| 889 | 909 | IV | Cecum | 4.8 | T3 | G2 | Through muscularis propria int subserosal tissue | Pos | 1/4 | N1 | Pos - Liver | M1 | moderately differentiated adenocarcinoma |
| 890 | 910 | IV | Ascending colon | | T3 | G2 | Through muscularis propria into subserosa. | Pos | 11/15 | N2 | Pos - Liver | M1 | |
| 891 | 911 | IV | Rectum | 5.2 | T3 | G2 | Invasion through muscularis propria into perirectal soft tissue | Pos | 4/15 | N2 | Pos - Liver | M1 | Perineural invasion present. |

**Table 1**



| Pt ID | Path ID | Grp | Anatom Loc | Size | Grade | Histo Grade | Local Invasion | Lymph Met | Lymph Met Incid | Reg Lymph Grade | Dist Met & Loc | Dist Met Grade | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 892 | 912 | IV | Sigmoid | 5.0 | T3 | G2 | Invasion into pericolic sort tissue. Tumor focally invading skeletal muscle attached to colon. | Pos | 1/28 | N1 | Pos - Liver, left and right lobe, omentum | M1 | Perineural invasion present, extensive. Patient with a history of colon cancer. |
| 893 | 913 | IV | Transverse colon | 6.0 | T3 | G2-G3 | Through muscularis propria into pericolic fat | Pos | 14/17 | N2 | Pos - Liver | M1 | Perineural invasion focally present. Omentum mass, but resection with no tumor identified. |
| 989 | 1009 | IV | Sigmoid | 6.0 | T3 | G2 | Invasion through colon wall and focally involving subserosal tissue. | Pos | 1/7 | N1 | Pos - Liver | M1 | Primary adenocarcinoma arising from tubulovillous adenoma. |